

Special coloured inlays on furniture in the mid-nineteenth century. Imitation of lacquer, ivory or horn?

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In Germany, a special type of coloured inlay was used for only a relatively short period of time, from 1840 to the mid 1850s. There have already been a few articles written concerning individual cabinetmakers or companies who worked with these coloured inlays, but the technique is not mentioned specifically or in detail.¹

This article will list pieces of furniture with these coloured inlays and present, in particular, two secretaries from the Wack Company in Kassel. The examination of and research into the materials used will be presented. This research was done by Stefanie van Wüllen in the course of her diploma

Figure 1 Armchair, 1844, Franz Xaver Fortner, Munich. Schloss Stolzenfels in Koblenz. Photo: Generaldirektion Kulturelles Erbe Rheinland-Pfalz, Jürgen Hocker.



thesis.² The technique and the manufacturing process of the coloured inlays will also be explained. Although this kind of marquetry had been utilised in renowned workshops at the time, it is only a fringe area of ornamental technique and has been little noticed until now. To gain a better insight, it was necessary to attempt a reconstruction.

Furniture and cabinetmakers/companies

The few pieces of furniture with coloured inlays which are known are located all over Germany and were produced in Lübeck, Hamburg, Kassel, Würzburg and Munich. Almost all the pieces are marked with a year and/or company name. Their common feature is the use of rosewood veneer. Furthermore, multi-coloured metal inlays, mother-of-pearl and ivory can be found. The earliest known marked piece of furniture is from 1842.

In the following table the cabinetmakers and their well-known works with coloured inlays are listed (table 1). All of them have also produced furniture without this special marquetry. But, for example, Fortner also used coloured horn for the marquetry on his furniture.³

Wack Company, Kassel

Two secretaries (inv. no. St. C. Gl. 772 a + b) in the possession of the Museumslandschaft Hessen Kassel were manufactured by the Wack company and dated 1842. They are signed – a little hidden however – on the inside of the furniture, and inlaid as a mirror image (figure 2). Ludwig Wack founded his company in Kassel in 1831, and as early as eight years later it had already grown significantly. On the occasion of the industrial exhibition that same year, Wack displayed an extensive range of products consisting of little objects such as combs and walking sticks, to name but a few. He also offered ready-made veneer fittings for secretaries, work

Figure 2 Signature Ludwig Wack in the secretary: L. WACK & COMP. CASSEL. 1842.



tables and tea tables. According to the exhibition catalogue these materials were only intended for the wholesale market.⁵ He supplied these veneers and readymade veneer fittings not only throughout Germany and neighbouring states but also to Russia and America.⁶

For the 1842 industrial exhibition at Kassel, Wack only provided a rosewood drop-front secretary inlaid with metal and mother-of-pearl in various colours.⁷ Maybe it is one of the two which are still in the possession of the Museumslandschaft Hessen Kassel?

It is known from letters and credit applications that Wack made veneers from wood, bone and ivory. A

'coloured wood cutting machine' in his possession is mentioned.⁸ Later, the Wack Company, taken over by his sons, produced cigar boxes and parquet floors, until its liquidation in 1903.

The two secretaries are constructed like *secrétaires à abattant* (figure 3). There is a drawer in the upper part, a drop front in the middle, and behind the two doors in the lower part there are drawers, so-called English drawers. Both drop-front secretaries are veneered with rosewood and metal marquetry on the outsides. Behind the drop front writing surface there is an open middle section with a mirrored rear panel (figure 4). The five drawers on each side as well as the two doors can be opened by using different buttons, wooden strips, and levers. In the

Table 1 List of cabinetmakers and furniture

Cabinetmaker/company, city	Furniture	Year	Current location	Coloured inlays	Bibliography
Brothers Barth: Adam (1815–82) and Stephan (1809–84) Barth, Würzburg	writing table	1842	Mainfränkisches Museum Würzburg	red, blue, white, green	Baron Döry 1974; Bahns 1987, fig. 3; van Wüllen, 2011
	small box	1850	Mainfränkisches Museum Würzburg	violet, blue, red, green, pink, orange and yellow	van Wüllen 2011, 51
Adam Neppenbacher (1801–1868), Würzburg	work table	1843	Mainfränkisches Museum Würzburg	green, violet, red, blue, light blue and dark pink	Trenschel 1973, 308–309; Bahns 1987, fig. 38
Franz Xaver Fortner (1798–1877), Munich	grand table	1842	Schloss Stolzenfels in Koblenz	red	Himmelheber 1973, 142, fig. 671, 672; van Wüllen 2011, 44, 142
	grand table (looks like the <i>contre partie</i> of the Stolzenfels table)	1843	was offered at Sotheby's in 1986	red, blue and green	Bahns, 1987, 10, 16, 44, fig. 1 frontispiece
	Armchair (figure 1)	1844	Schloss Stolzenfels in Koblenz	red, blue, pink[4]	Himmelheber 1973, 142, fig. 755; van Wüllen 2011, 44, 144
Carl Friedrich Heinrich Plambeck (1814–1879), Hamburg	grand table	1851	Museum für Kunst und Gewerbe in Hamburg	White, yellow, red, purple, blue and green	Himmelheber 1973, 163, fig. 699; Jedding et.al. 1977, 13–16; Bahns 1987, 97–98, fig. 60; van Wüllen 2011, 47–49, 145–147
	grand table	1848	Schloss Schwerin	Blue, green, red, purple	Möller 2013, p.312–316, fig.219
Ludwig Wack (1798–1875) and Company, Kassel	secretary	1842	Museumslandschaft Hessen Kassel	White	Weinberger, 1994, 31–34, fig. 572
	secretary	1842	Museumslandschaft Hessen Kassel	White, yellow, rose, blue, red, and green	Weinberger, 1994, 71–73, fig. 621
Unknown Producer, Lübeck or Hamburg	writing desk	1850–1860	St. Annen Museum in Lübeck	white, blue, purple, yellow, green, red	Himmelheber 1973, fig. 674; Jedding 1977, fig. 14; Bahns 1987, fig. 36; van Wüllen 2011, 50–51, 148–149
	writing desk	1840–1850	St. Annen Museum in Lübeck	white, blue, tortoiseshell-coloured	van Wüllen 2011, 46–47, 144–145
	work table	1850–1860	St. Annen Museum in Lübeck	white, blue, purple, yellow, green	van Wüllen 2011, 49–50, 147–148



Figures 3a, b Drop-front secretaries, both 1842, Wack Company, Kassel. Museumslandschaft Hessen Kassel.
Figure 3a Inv. no. St. C. Gl. 772a (right).
Figure 3b Inv. no. St. C. Gl. 772b (left).



Figures 4a, b Secretaries, Wack: behind the drop front writing surface.

Figure 4a Inv. no. St. C. Gl. 772a (right).

Figure 4b Inv. no. St. C. Gl. 772b (left).



Figure 5 Secretary, Wack, inv. no. St. C. Gl. 772a: Detail of the coloured inlays in yellow, rose, blue, red, and green.



interior there are no visible locking mechanisms such as keyholes as there are on the outsides of the drop front and doors.

The sections behind the drop front are decorated with these special materials: one of the secretaries has white inlays, in imitation of ivory. The other one, an example of oriental historicism, features not only mother-of-pearl, wood veneer and metal, but also inlays in yellow, rose, blue, red, white and green (figure 5).

Examination and analysis

We began by researching the literature on the prominent German objects, in order to find information on what the materials consisted of. Unfortunately, there were not many clues. In reports contemporary with production of the objects it is unfortunately not mentioned. In later literature it is usually referred to as lacquer, matter or paste, or labelled as horn, ivory or mother-of-pearl.⁹ Only the son of an employee of the Barth Company in Würzburg, who produced the writing table for the Grand Duke, indicates around 1924 the use of 'artificial, coloured veneers'.¹⁰

The examination of the Kassel objects and their comparative pieces led to the exclusion of naturally grown materials such as ivory or mother-of-pearl as they had different surface textures and damage patterns. Closer scrutiny, under magnification, showed further details of the Kassel objects. It became apparent, as the red inlay shows, that this is a pigmented material (figure 6). Furthermore, there are saw cuts discernible on the edges (figure 7). Therefore, it can be concluded that the joints surrounding the single colours were not created by the drying of a material that had been applied wet, but by a saw cut of 0.13 mm (0.0051 inches) to 0.3 mm (0.012 inches) width (figure 8). These saw cuts are also to be found on all other comparative pieces that were examined. Little drill holes and saw cuts originating from those holes point to the cutting of the material as a veneer packet (figure 9). The veneer itself has a thickness of 0.5 mm (0.019 inches). The chipped edges of the engravings reveal the brittle character of the material.¹⁰ The fact that the engraving extends into the filling agent of the saw cut points to a multi-stage finishing of the marquetry (figure 11). All these hints lead to the conclusion that the use of a viscous liquid material such as a lacquer paste can be excluded.

At the same time, the material was examined by means of various analytical techniques. These

Figure 10 Secretary, Wack, inv. no. St. C. Gl. 772a: Engraving of the coloured inlay.

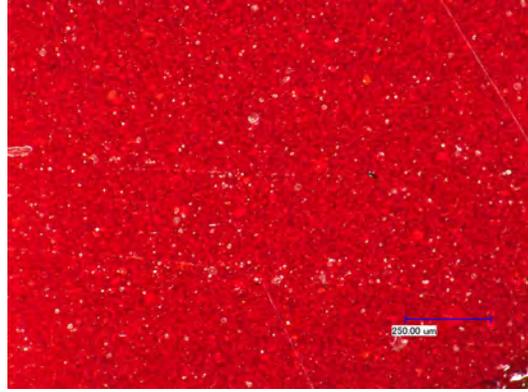


Figure 6 Secretary, Wack, inv. no. St. C. Gl. 772a: Detail of the red inlay.



Figure 7 Secretary, Wack, inv. no. St. C. Gl. 772a: Saw cuts on frame of the inner door.

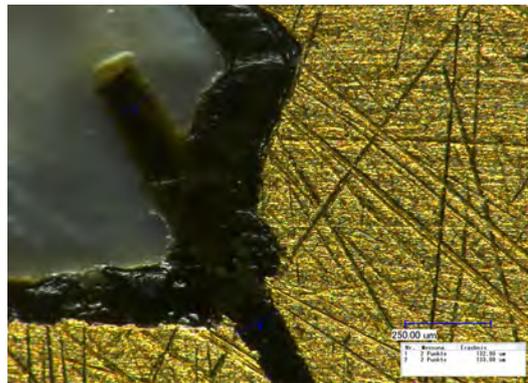


Figure 8 Secretary, Wack, inv. no. St. C. Gl. 772a: Detail of a kerf, saw blade diameter 0.13 mm.



Figure 9 Secretary, Wack, inv. no. St. C. Gl. 772a: Borehole within the marquetry.

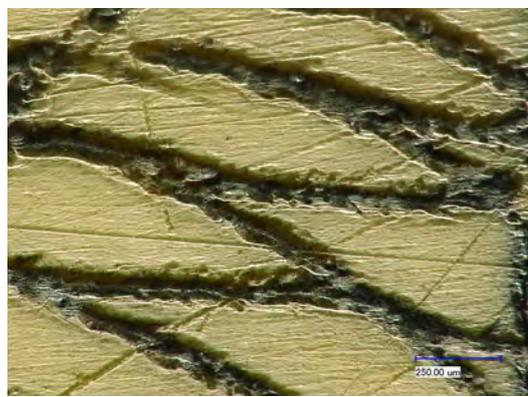
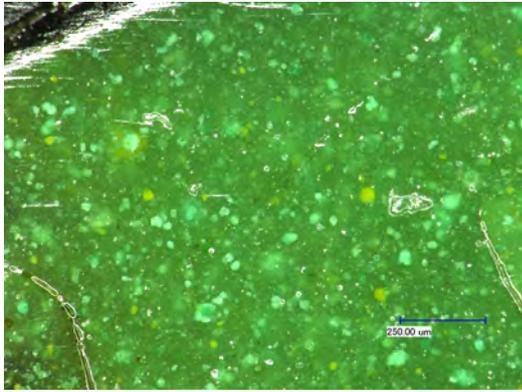




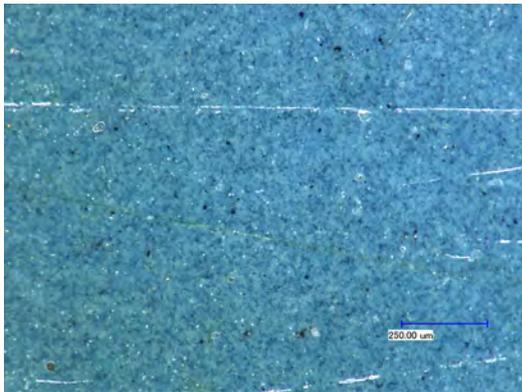
Figure 11 Secretary, Wack, inv. no. St. C. Gl. 772a: Engraving of the inlays and the filling agent.



Figures 12a, b Secretary, Wack, inv. no. St. C. Gl. 772a: Coloured inlays under magnification.

Figure 12a Green copper pigment.

Figure 12b Prussian blue.



Figures 13a-c Warped sheets of the reconstruction.

Figure 13a Sheet after alum bath.

Figure 13b Sheet after drying in a heating cabinet.

Figure 13c Sheet with talcum fringes.



showed that the binder was not, as hypothesised in the literature, an oil or a resin, but a protein. The spectrums of the FTIR (fourier transform infrared spectroscopy) analysis showing the greatest congruence with animal glue. The restorers examining the coloured inlays of the armchair by Franz Xaver Fortner came to the same conclusion.¹¹ To fill the joints and engravings, a gum copal-oil varnish mixed with vine black was used. White lead sulphate was used as white pigment. Indications of alum were found.¹² VIS-Spectroscopy,¹³ a non-destructive analysis, led to the conclusion that Prussian blue,¹⁴ vermilion, cochineal,¹⁵ green copper pigments and chrome yellow or cadmium yellow were used for the colouration.¹²

Reconstruction

Equipped with these observations and analytical results a search to find instructions and a formula for making such material was started. A recipe 'for the fabrication of artificial ivory veneers' in the reports of the Polytechnischer Verein für das Königreich Bayern (Polytechnic Society for the Kingdom of Bavaria), dating from 1853,¹⁶ as well as a formula for glue-veneers from the year 1857¹⁷ were found. In both recipes a mixture of animal glue and alum is blended with the chosen pigment. This mixture is poured onto a glass top and dried. The sheets thus obtained are then treated again with an alum solution, and dried once more.

What sounds quite simple in the theoretic description led to some difficulties during the practical execution. Referring to the recipes, and after several experiments, a 10% solution of animal glue (one part bone to four parts hide glue) with 2.5% by weight of alum was used. By the addition of alum the sensitivity of the dried sheets to moisture was reduced, so further processing would be much easier.

The dried sheets, no matter whether dried at a normal, slow or at a fast pace, were always very warped (figure 13). The ensuing alum bath only led to a short-term improvement. In addition, the sheets were quite brittle; even if a smooth surface could have been achieved, processing them in a veneer packet would not have been possible. Numerous attempts and further research of related recipes led to slight modifications such as warming the glass plates, adding tiny amounts of linseed oil (less than 2% by weight) and omitting the alum bath. This finally led to a viable result (figure 14). This way of proceeding led to smooth, even, and slightly elastic veneers that could be used for further processing and also stand up to comparison, optically, with the original material.

After producing some sheets of the right thickness to be cut in a packet, the reconstruction of the marquetry was started. In this way it was possible to determine if the processing, as it had been imagined from the research, was actually feasible. But replicating the technique also had its own pitfalls, which were to be encountered particularly in sawing the veneer packets with the very fine saw blades. As glue in veneer packets damages the saw blades,¹⁸ glue-veneers probably had negative effects on their durability.

The comment of the above-mentioned son of an employee of the Barth company in Würzburg,

Figures 14a, b Veneers after slight modifications of the recipe.

Figure 14a Veneer with cadmium yellow.

Figure 14b Veneer with Prussian blue.



who stated that his father had used 144 dozen saw blades for the manufacturing of a writing table,¹⁹ was quickly put into perspective by our use of 50 saw blades, 0.16 mm (0.063 inches) thick, for two little test sheets. In all other aspects, however, the veneers proved to be very stable and could be finished in detail. The engravings could be done with a pointed needle. When comparing the surfaces they each showed a similar composition. Filling the joints with gum copal-oil varnish and subsequently applying the final sanding touch also confirmed the feasibility of this process (figure 15).

Conclusion

Determining the composition of the coloured

Figures 15a-e Reconstructing technique.



Figure 15a Motif cut in the packet.

veneers is important both for understanding the material's behaviour and for potential restoration. As test material was limited, the combination of analysis and experiments proved a good method for reconstructing the coloured veneers. The proof that this material can be produced relatively easily may explain the prevalence of coloured inlays throughout Germany. Further research and finding more comparative pieces are nonetheless still necessary.

Did these coloured inlays serve as imitation material, or didn't they? As far as the white veneer is concerned one could easily think of it as a substitute for bone or ivory. However, when it comes to the coloured variants, it is not clear whether they served as imitation for valuable materials like colourfully underlaid horn or coloured ivory. Or maybe it had been intended to be a durable variant of the colourful marquetry wood, such as is found on Roentgen furniture. At the time of the production of these pieces of furniture, in the mid-nineteenth century, the coloured inlays of grand ornate furniture may not have completely faded, but the problem of the effect of light changing bright colours to various shades of brown was surely known. Maybe this was an attempt at countering this problem in these times that were so rich in new materials and inventions? The success is proven in the vibrancy of the colours, still so well-preserved today.

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Figure 15d Motif with filled kerfs.

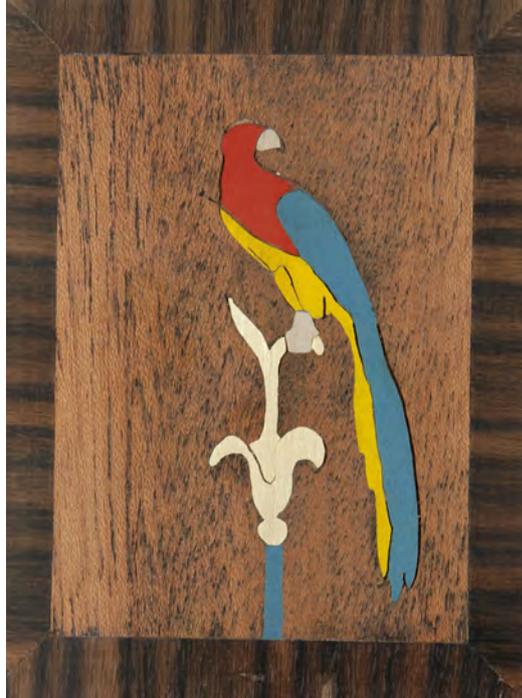
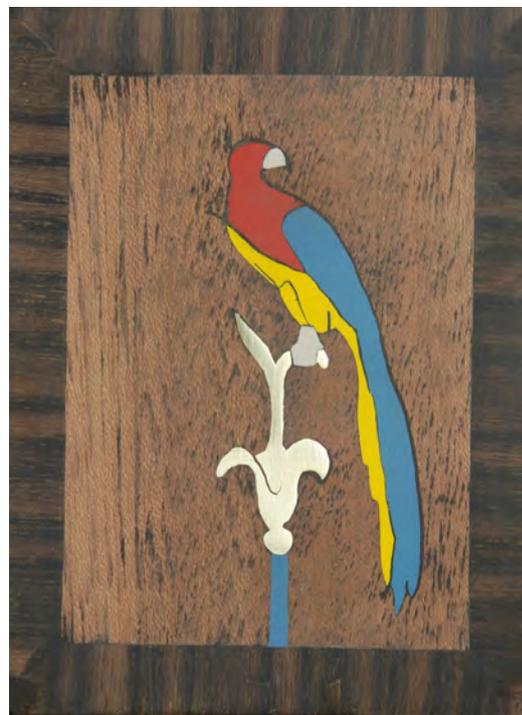


Figure 15b Motif glued onto surface.

Figure 15c Motif with filling agent.



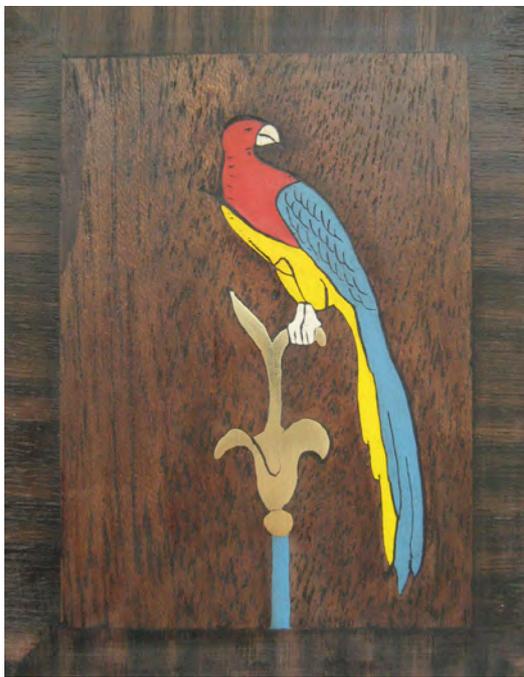


Figure 15e Motif with engravings.

Generaldirektion Kulturelles Erbe Rheinland-Pfalz. Thanks also to the restorers and art historians at the following institutions: Museum für Kunst und Gewerbe, Hamburg; St. Annen Museum Lübeck; Mainfränkisches Museum Würzburg.

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Notes

¹ None complete listing: K.-H. Wirsing, 'Ein Werkverzeichnis des Würzburger Kunstschreiners Adam Barth (1815-82)', in: *Würzburger Diözesan-Geschichtsblätter*, 34. Band, 1972, pp. 145-155. G. Himmelheber, 'Klassizismus, Historismus, Jugendstil', in: *Die Kunst des deutschen Möbels*, Band 3, H. Kreisel, 1973. H.-P. Trenschele, 'Die Neuerwerbungen des Mainfränkischen Museums Würzburg 1966-1972', in: *Mainfränkisches Jahrbuch*, Vol. 25, 1973, pp. 308-309. L. Baron Döry, 'Die Möbelwerkstatt Barth in Würzburg bis 1851. Zur Geschichte der Boulle-Möbel im 19. Jahrhundert', in: *Anzeiger des Germanischen Nationalmuseums Nürnberg*, 1974, pp. 124-143. H. Jedding, *Hohe Kunst zwischen Biedermeier und Jugendstil: Historismus in Hamburg und Norddeutschland*, Hamburg, 1977, pp. 13-16. E. Brockmüller, 'C.F.H. Plambeck (1814-1879). Tischler, Decoupeur, Graveur. Ein Beitrag zur Intarsien-geschichte des 19. Jahrhunderts',

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³ R. Schwarz, H. Piening, 'VIS-Spektroskopie zur Farbanalyse. Ein Salontisch mit farbig unterlegten Marketerien', in: *Restaura* 7, 2001, pp. 538-541.

⁴ Friendly written notice from Jutta Waschke, Generaldirektion Kulturelles Erbe Rheinland-Pfalz, 27-9-2016.

⁵ *Gewerbeverein 1839*, p. 26 after van Wüllen 2011, p. 12.

⁶ Hessisches Staatsarchiv Marburg HSTAM Best. 18 Nr. 1107. Request of the manufacturer Wack for a loan of 21000 Reichstaler from the Landeskreditkasse or rather the regional division. Letter of 17th July 1848 (Ludwig Wack). Letter from Wack to the electoral regional head office requesting a prepayment of 2000 Talern on his applied loan. After van Wüllen 2011, p. 13-14.

⁷ *Gewerbeverein 1842*, 21 after van Wüllen 2011, p. 13.

⁸ HSTAM Best. 18 No. 1107 after van Wüllen 2011, pp. 15-16.

⁹ Weinberger 1994, p. 31, p. 71. H. Lehmbruch, 'Einrichtung und Möbel,' in: *Das pompöse Zeitalter*. Published by H. J. Hansen. Oldenburg, Hamburg 1970, p. 71-110, p. 97. Döry 1974, p. 129, p. 139. Bahns 1987, p. 17, p. 71. Trenschele 1997, p. 310.

¹⁰ Döry 1974, p. 126. According to a description of Ludwig Link, son of the cabinetmaker Johann Link, who worked on this object.

¹¹ Friendly written notice from Jutta Waschke, Generaldirektion Kulturelles Erbe Rheinland-Pfalz, 27-9-2016. Analysis: Mikroanalytisches Labor Dr. Jägers in Bornheim.

¹² Making and evaluations of the FTIR spectra kindly done by Prof. Dr. Elisabeth Jägers, FH Cologne.

¹³ Measurements and evaluations of the spectra kindly done by Dr. Doris Oltrogge, FH Cologne.

¹⁴ Ultramarine was analysed as pigment for the blue inlays of the Fortner armchair, friendly written notice from Jutta Waschke, Generaldirektion Kulturelles Erbe Rheinland-Pfalz, 27-9-2016.

Analysis: Mikroanalytisches Labor Dr. Jägers in Bornheim

¹⁵ A red dye based on Anthrachinon was analysed for the Fortner armchair, friendly written notice from Jutta Waschke, Generaldirektion Kulturelles Erbe Rheinland-Pfalz, 27-9-2016. Analysis: Mikroanalytisches Labor Dr. Jägers in Bornheim.

¹⁶ Kunst- und Gewerbeblatt. Published by: Polytechnischer Verein für das Königreich Bayern. 39. Jahrgang des Kunst- und Gewerbeblattes or Vol. 31. Munich 1853, Sp. 380–381. According to the text the recipe originated from: Gewerbeblatt aus Württemberg, No 18, 1853. The original text could not be consulted.

¹⁷ K. Karmarsch: *Handbuch der mechanischen Technologie*. Vol. 1. 3rd increased edition Hannover 1857, p. 800.

¹⁸ P. Ramond: *Marquetry*, Newtown 1989, p. 128.

¹⁹ Döry 1974, p. 126.

Photography credits

- All photos were taken by Stefanie van Wüllen unless otherwise stated.